# ESTIMATES OF HOUSEHOLDS BY INCOME FOR COLORADO AND ITS REGIONS
# September 25, 2003

## Documentation:

### Overview

The estimates were developed in order to give a more complete picture of Colorado households' ability to meet housing needs. The estimates cover the number of households by current income class for four household types (more than one adult with children, more than one adult with no children, one adult with children and one adult with no children) by four age groups (householder age 18-24, 25-44, 45-64, or 65 and over) for each of Colorado's 14 Planning and Management Regions and the State as a whole. Estimates are also divided by tenure with a similar data set for both homeowners and renters. The estimates cover the years 1990, 1995 and 1999 through 2004.

The estimates update the 1990 Census data based on more recent statistics and forecasts. Reliable estimates of household distribution by income are available for 1989 from the 1990 Census. Data from the 2000 Census at the level of detail necessary to base projections on the latter Census were not available at the time this report was prepared. Subsequent changes in income distribution can be explained by changes in household type, e.g. more aged or single parent households, and changes in income due to inflation and real income growth. Income growth affects different groups of households in different ways that in turn affect the distribution of income by household. First the number of households of each age, and type was estimated for each year for all 14 regions. Then income growth was calculated, which in turn moved some of the households into different income classes. Finally, the results were compared to available data from the 2000 Census and adjusted to the Census results.

### Definitions

Income is that reported on the 1990 Census, which covers income received in 1989. Future years' income figures represent updates of the income estimated by the Census. The Census income concept includes wages, self-employment income, interest, dividends, net rental income, social security income, public assistance income such as AFDC or SSI and retirement income. Capital gains or proceeds for sales of property are not included as income.

Households are groups of one or more persons occupying a housing unit. A household may be a single family, one person living alone, or two or more families or unrelated persons living together. Persons not in households are in group-quarters, which include prisons, school dormitories, nursing homes or military barracks. No estimates of group-quarters income were prepared for this report.

## Household Estimates and Projections

The Demography section of the Colorado Division of Local Government prepared estimates of households by type for the years 1990 through 2004. (The term estimates refers to historical data and projections to data for future years. As the numbers presented here cover both past and future the term estimates will be used to refer to both.) Estimates were prepared for each of the state's 14 planning and management regions. The household estimates were based on the population estimates prepared by the Demography section. They cover population by age for each year for all the 14 regions. The section's estimates begin with the 1990 Census, with estimates through 2002 based on information on income tax filings, school enrollments and other indicators. Projections beyond 2002 were developed using projected fertility and mortality rates and forecasts of migration based on job growth and other factors.

The estimates of households were prepared in two stages. First, household population was computed as the difference between total population and group quarters population. Then the number of households was derived by applying rates or proportions of householders (heads of households) for each household type to the total household population in each age-gender group. The household estimates were adjusted to make them consistent with currently available 2000 Census estimates of households by region and type of household.

The result of the above-described process was a set of estimates of the number of households by type and age group for each region. Within each age/type "cell" Census data provided the distribution of households by income class for 1989. This initial set of estimates covered the number of households in each age/type/income cell. This initial estimate did not adjust for income change after 1989.

## Average Income estimates and projections

The next step was computing the change between 1989 and 2004 in average income within each of the age/type/income cells. Average income from each income source was calculated using a base year (1989) profile of income by income type for each household type and income class. The 1989 profile was that reported in the 1990 Census, which reflects 1990 numbers of households and 1989 income. Calculations were done at both the state and regional level, with regional totals then adjusted to state totals.

Average income estimates were updated based on income estimates prepared for each county by the US Department of Commerce, Bureau of Economic Analysis (BEA). The BEA figures were available through 2001. These figures differ somewhat in concept from those reported in the Census. For example, BEA rental income includes rent imputed to homeowners. The Census income categories and the corresponding BEA income categories used to update average household income are shown in Table 1 below.

Annual changes in average income were calculated for each income type, within each region, for each age/household-type/income class cell. The annual change in average household income was computed based on the changes in per-household income in each income category for that region. An attempt was made to account for commuting. Household income is based on place of residence while BEA earnings are based on place of work. In regions with sizable commuting in or out, for example Region 5 containing Elbert County where many residents hold jobs in Region 3, this distorts household income estimates. To account for the residence adjustment was added to non-farm wage and salary income to adjust for commuting. The per-household change in BEA income for each income type was then applied to the average income of that type in each cell.

For example households with more than one adult with children between 18 and 25 in Region 3 earning between $30-35,000 earned an average of $32,345 in 1989. In 1990 average wages and salaries increased 6.6 percent from $30,517 to $32,536. (These figures were calculated based on BEA wage and salary earnings and the estimates of the number of households described above.) At the same time non-farm self-employment income increased 4.2 percent, farm self-employment income increased 5.6 percent, interest income increased 5.2 percent, retirement income increase 7.4 percent and other income increased 6.9 percent. The sum of these parts added up to $34,870 for 1990 average income for this group. This process was followed for all income groups and household types in each region and for each year for which estimates were prepared..

Estimates for years after 2001 were prepared using a similar method based on forecasts of growth in personal income by region prepared by CBEF. The CBEF forecasts were not available at the same level of detail as the BEA figures, so somewhat different income elements were used in these projections. The elements used are shown in Table 1. In Table 1, the column “Census Income Category” refers to the way the income is described in the Census. The column “Estimate 90-2001” shows the BEA Personal Income category used to project average income through 2000. The column “Projection 2002-2004” shows the income category used in the projection for these years. Again the increases in personal income per household were applied to each income class and household type.

**Table 1**
**Income Categories Used in Projections**

| Census Income Category | Estimate 90-2001 | Projection 2002-04 |
|---|---|---|
| Wages and Salary | Wages & Salary + Residence Adjustment | Nonfarm Earnings + Residency Adjustment |
| Nonfarm Self Employment Income | Nonfarm Proprietors Income | Nonfarm Earnings |
| Farm Self Employment Income | Farm Proprietors Income | Farm Earnings |
| Interest, Dividends and Rent | Property Income | Property Income |
| Social Security | OASDI | Transfer Payments |
| Public Assistance | Public Assistance | Transfer Payments |
| Retirement Income | Other Retirement | Transfer Payments |
| Other Income | Total Personal Income | Total Personal Income |

For all years, the same methodology was applied to arrive at statewide income figures. The regional estimates were then forced to state totals.

## Calculation of households by income class

As described earlier, average household income and the number of households in each income class was projected through 2004. The initial projections were based on 1989 income levels. For example, the 1995 estimate of number of households and average income in the $20,000 to $25,000 class, was based on 1989 incomes in that group. In order to analyze 1995 income distributions it was necessary to estimate the number of households in the $20,000 to $25,000 class based on 1995 incomes. Some or all of the households in the $20,000 to $25,000 class based on 1989 income levels will be in higher income classes based on 1995 income.

The first step in estimating the distributions of households expressed in current dollars was to re-estimate the 1989 income classes in current income terms. In other words, the $20,000 to $25,000 class on a 1989 base would correspond to $24,000 to $29,500 on 1995 base with the later numbers based on average income growth between 1989 and 1995. The new income ranges were calculated based on growth in mean incomes in affected income class. For example, the $20,000 to $25,000 income class boundaries were calculated to grow at the growth rate of mean incomes in the $20,000 to $25,000 class.

Then it was necessary to estimate the number of households in the new income classes. For this calculation it was assumed that households within the income classes were evenly distributed by income. In the example described above, the households in the $20-25,000 class ($89) were, in 1995, distributed evenly between $24,000 and $29,500. The proportion of households in the $20,000 to $25,000 class would then be $25,000 minus $24,000 (the part of the income range in that class) divided by $29,500-$24,000

(the size of the entire income range). The rest of the households would shift into the $25-30,000 class. This calculation for the example is summarized in the Table 2 below.

**Table 2**
**Sample Calculation of Households by Income Class**

| | | | |
|---|---|---|---|
| **Income Class Based on 89 Income** | | **From** | **$20,000** |
| | | **To** | **$25,000** |
| **# of Housheolds in 89** | | | |
| **Income Class Based on 95 Income** | | **From** | **$24,000** |
| | | **To** | **$29,500** |
| **# of Households in 95** | | | **3,800** |
| **Calculation of HH by Income Class in 95** | | | |
| **Income Class** | | | |
| **$20-$25,000** | **3,800*($25,000-$24,000)/($29,500-$24,000)** | **=** | **691** |
| **$25-$30,000** | **3,800*($29,500-$25,000)/($29,500-$24,000)** | **=** | **3,109** |

The process described was applied to all income/household type cells for all years and for all regions. State totals were then computed as the sums of regions.

## Estimates by Tenure

The estimates of all households by income class described above were distributed by tenure based on the share of homeowners in each age/household type/income class cell for each region. The estimated share of homeowners in each cell was initially assumed to remain unchanged from that reported in the 1990 Census. Then each cell's home ownership rate was adjusted to conform to its region's overall home ownership rate. The regional rates were calculated based on the 1990 Census and the 2000 Census with intervening years interpolated between the two years' figures. After 2000 home ownership rates for each cell were projected based on trends in the 1990-2000 period.

## Comparison with Earlier Estimates

The latest set of estimates reflect the weaker than expected Colorado economy in late 2002 and so far in 2003. As a result household incomes are, on the whole, lower in the latest estimates than in those prepared a year ago. Charts 1 and 2 compare the two sets of estimates. A more detailed comparison of the model and 2002 estimates with the Census are shown in the Appendix tables. Chart 1 compares the two estimates of the state median income for all households. The latest estimate for the year 2001 is some $900 or a little less than 2 percent lower than that made last year. This adjustment is due to a new lower estimate of 2001 personal income from the US Department of Commerce. A weaker Colorado economy in both 2002 and 2003 has caused estimates for these two years to be reduced. The latest 2002 figure is $2,100 or 4 percent lower than that estimated last year. For 2003, the new estimate is $3,700 or 6.7 percent lower.

**Chart 1**

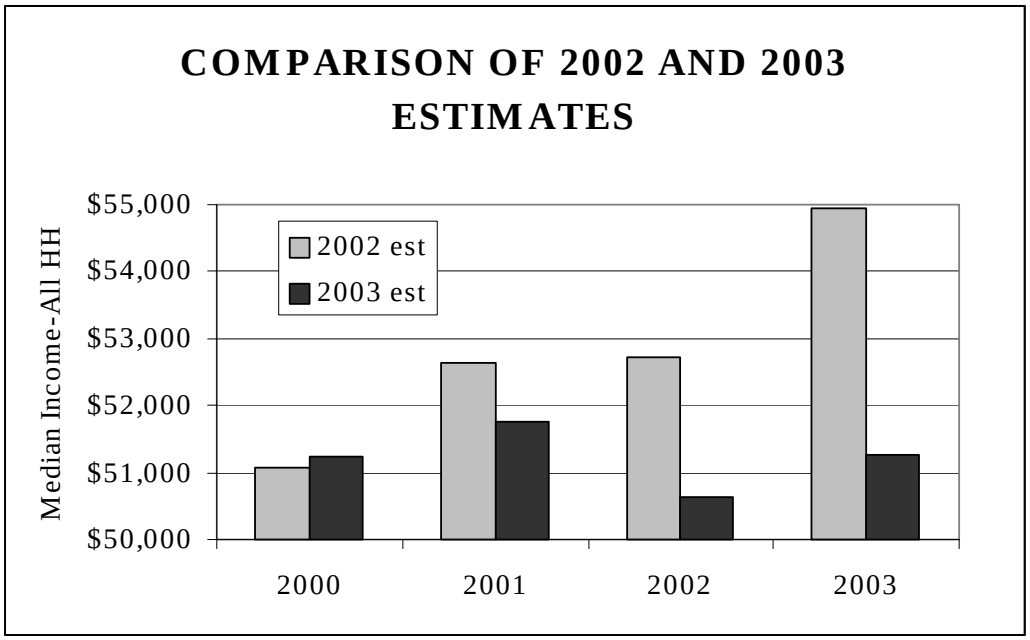
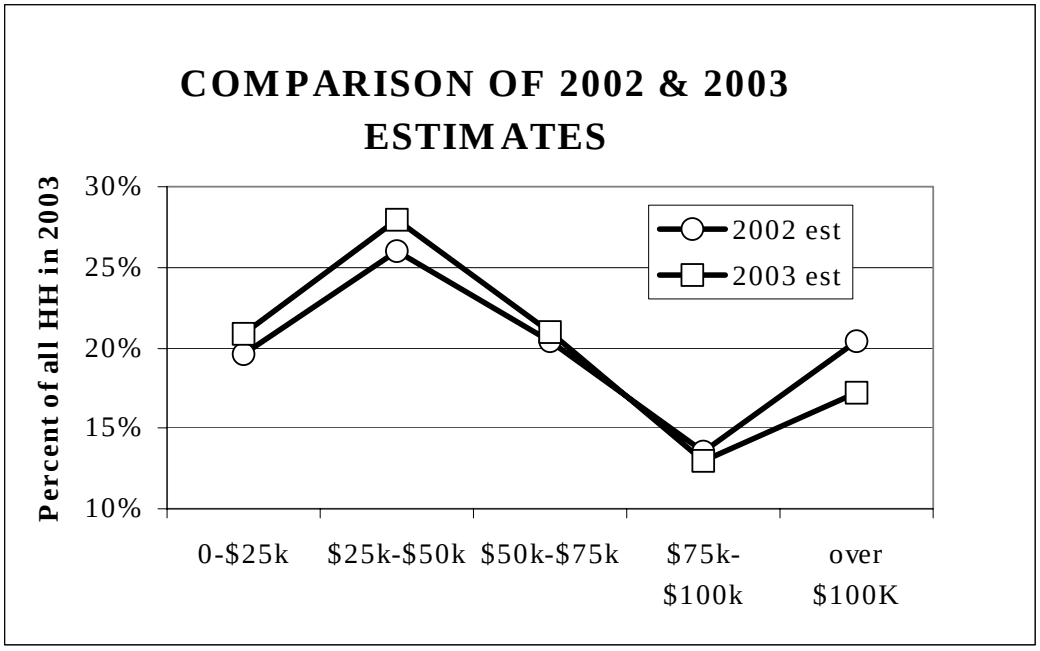


Chart 2 compares the distribution of households by income class in the two estimates. It shows the percentage of households in 2003 estimated to fall in five income groups. The newer estimate shows fewer households in the highest income class and fewer in the lowest 2 income classes. The total number of households did not change significantly between the two estimates.

**Chart 2**




**Changes in Colorado Economic Outlook**

The methodology for these estimates was essentially the same as that used in 2002. Differences between the two estimates can be explained almost entirely by a more pessimistic outlook for the Colorado economy. This includes a lower estimate for Colorado income in 2001. Historical estimates are revised as more information becomes available. It is common for recent historical figures to be revised downward when, as was the case in 2001 and 2002, the economy is weak.

The new estimates also incorporate a gloomier economic picture for 2002 and 2003. When last years estimates were prepared, preliminary Colorado personal income estimates were available through the first quarter of 2002. The outlook at that time called for a recovery in the Colorado economy, largely driven by a stronger US economy, beginning roughly mid-year 2002. The recovery did not occur; in fact both the US and Colorado economy were flat or declined through early 2003. The latest forecast calls for recovery to get underway by the second half of 2003. In mid-summer there are signs that

such a recovery is now underway. As Table 3 shows the new forecast means significantly slower growth in personal income. Since personal income is the dominant variable in preparing the household income estimates, this means that estimated income in households will also grow more slowly.

## Table 3
## Comparison of Colorado Forecasts

| Colorado Economic Variable | Average Growth '98-2000 | Growth in 2001 | Growth in 2002 | Growth in 2003 | Growth in 2004 |
|---|---|---|---|---|---|
| **2002 Forecast** | | | | | |
| **Employment** | **3.8%** | **0.9%** | **-0.7%** | **3.0%** | |
| **Personal Income** | **9.6%** | **5.1%** | **2.4%** | **6.4%** | |
| **2003 Forecast** | | | | | |
| **Employment** | **3.8%** | **0.6%** | **-2.1%** | **-0.2%** | **1.4%** |
| **Personal Income** | **9.6%** | **3.6%** | **0.8%** | **3.1%** | **5.8%** |

## Summary of Results:

Chart 3 below shows state median household income by year. Estimated median income grew 4.7 percent annually between 1990 and 1995. It accelerated to a growth rate of 5.7 percent per year through 1999 and grew 7.7 percent in 2000. This was due to the strong economy and the effects of a very tight labor market on wages. But the Colorado economy slowed sharply beginning in early 2001. Median income is estimated to have increased 1.1 percent in 2001 and declined 2.2 percent gain in 2002. The state economy is expected to be essentially flat in 2003 with median income increasing 1.3 percent. As the recovery progresses median income increases 3.8 percent in 2004, a marked improvement over the previous three years but well short of the growth in the 1990s.

**Chart 3**

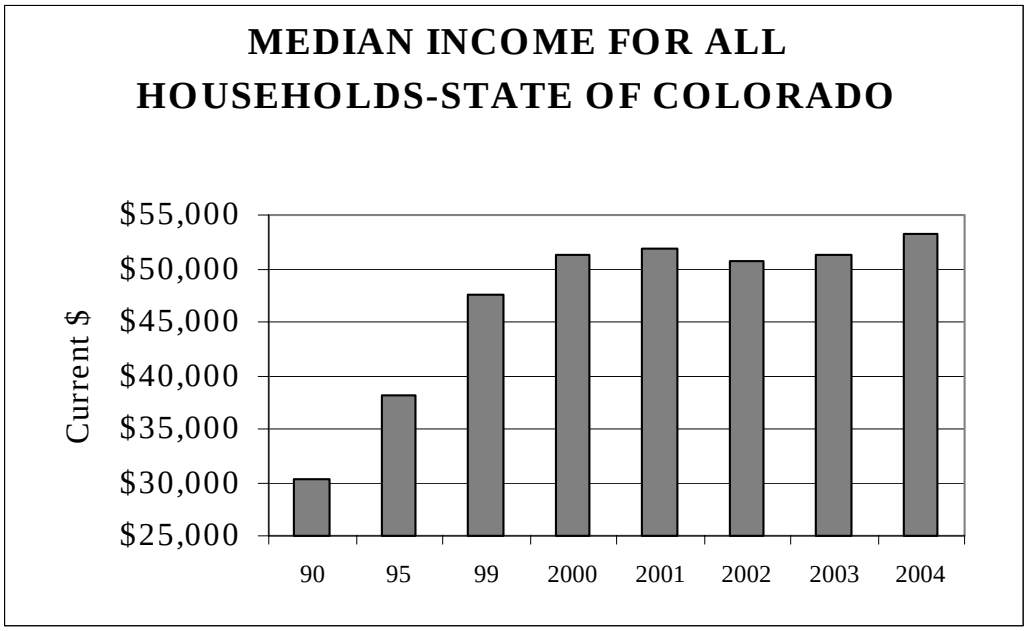



Chart 4 compares median incomes for different categories of households for January 1, 2004. Households with more than one adult, principally those headed by married couples, show much higher incomes than those with only one adult. The one adult without children households, containing large numbers of older persons as well as young persons living alone, show somewhat higher incomes than households with one adult and children. The latter category which, is largely made up of single mothers and their children, has the lowest median income of any household type.

**Chart 4**

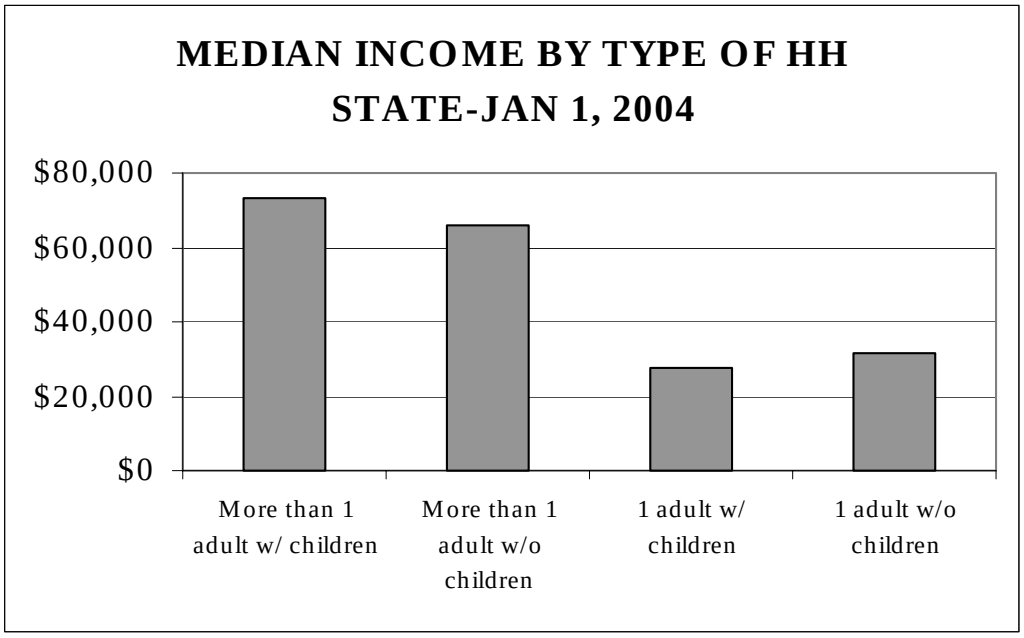



Chart 5 shows median income by age of householder on January 1, 2004. Households with the householder in prime working years (25-64) are estimated to have much higher incomes than those with persons either just entering the work force (18-24) or predominately retired (over 65).

**Chart 5**

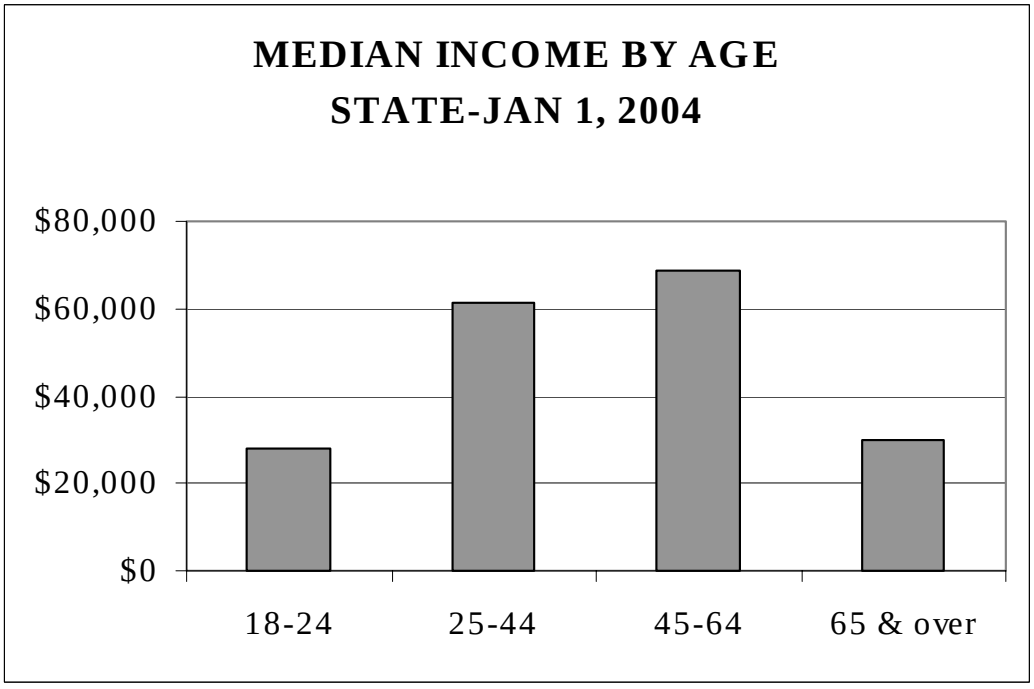


Chart 6 shows median incomes for the state's 14 planning and management regions for January 1, 2004. The regions with major metropolitan areas along the Front Range showed high incomes. Metro Denver's median income is more than $60,000 while that in Region 2 (Weld and Larimer counties) and Region 4 (Colorado Springs and environs) were slightly above $50,000. Region 12 (Northern Mountains), which includes most of the state's largest ski areas, had the highest median income of any region in the state. Regions 6, 8 and 14 are estimated to have median incomes slightly more than half that in the Regions 3 or 12.

**Chart 6**

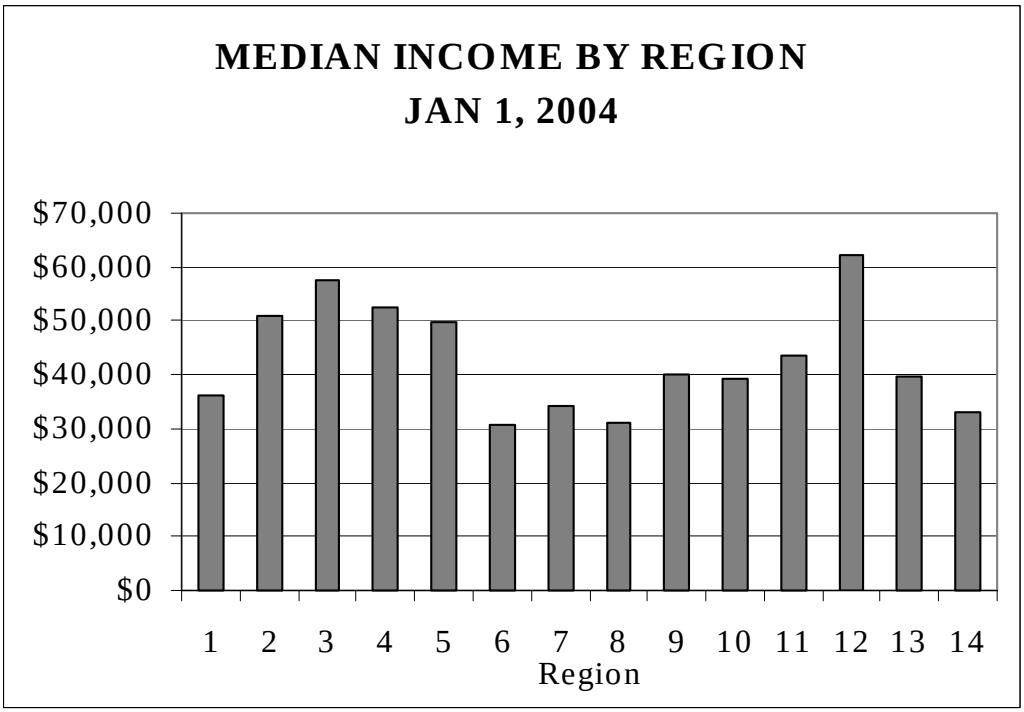
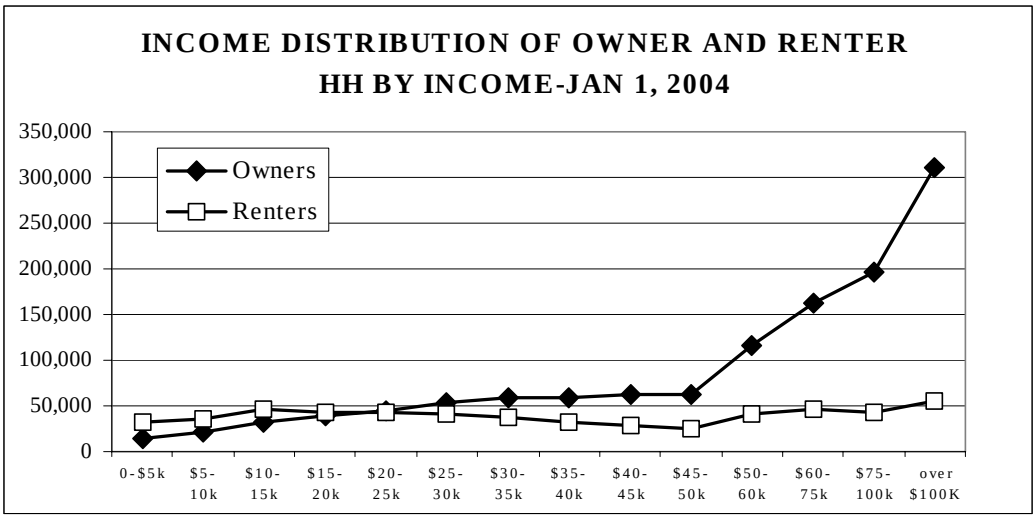


Chart 7 compares the distribution of households by income for homeowners and renters. Renters are evenly distributed through the income ranges while homeowners are concentrated at higher income levels.

**Chart 7**



## Colorado Planning and Management Regions

(Note: Broomfield County, formed January 1, 2002, is Region 3. Prior to County's formation, population in what was to become Broomfield County was in other counties in the that region.)

| Region | Description | Counties |
|---|---|---|
| Region 1 | Northeastern Colorado | Logan, Morgan, Phillips, Sedgwick, Washington, Yuma |
| Region 2 | Larimer-Weld | Larimer, Weld |
| Region 3 | Metro Denver | Adams, Arapahoe, Boulder, Clear Creek, Gilpin, Denver, Douglas Jefferson |
| Region 4 | Pikes Peak (Colorado Springs) | El Paso, Park, Teller |
| Region 5 | East Central Colorado | Cheyenne, Elbert, Kit Carson, Lincoln |
| Region 6 | Lower Arkansas Valley | Baca, Bent, Crowley, Kiowa Otero, Prowers |
| Region 7 | Pueblo | Pueblo |
| Region 8 | San Luis Valley | Alamosa, Conejos, Costilla, Mineral, Rio Grande, Saguache |
| Region 9 | San Juan Region (SW Colorado) | Archuleta, Dolores, La Plata, Montezuma, San Juan |
| Region 10 | West Central Colorado | Delta, Gunnison, Hinsdale, Montrose, Ouray, San Miguel |
| Region 11 | Plateau Region (NW Colorado) | Garfield, Mesa, Moffat, Rio Blanco, Routt |
| Region 12 | Northern Mountains | Eagle, Grand, Jackson, Pitkin, Summit |
| Region 13 | Upper Arkansas Valley | Chaffee, Custer, Fremont, Lake |
| Region 14 | Huerfano-Las Animas | Huerfano, Las Animas |